AIR QUALITY PERMIT

Issued To: International Malting Company, LLC
Great Falls
P.O. Box 712
Milwaukee, WI 53201

Permit: #3238-03
Administrative Amendment (AA) Request Received: 11/16/06
Department Decision on AA: 12/18/06
Permit Final:
AFS: #013-0035

An air quality permit, with conditions, is hereby granted to International Malting Company, LLC – Great Falls (IMC), pursuant to Sections 75-2-204 and 211 of the Montana Code annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

The IMC facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE¼ of the SE¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

B. Current Permit Action

On November 16, 2006, the Montana Department of Environmental Quality (Department) received notification of proposed changes in operations at the IMC facility in accordance with the provisions contained in the Administrative Rules of Montana (ARM) 17.8.745 (de minimis rule). Specifically, IMC proposed a change in the actual location of the facility fabric filter baghouses and kiln vents, updates to the kiln building dimensions, a change in the type of emission source for baghouse BF03 from a point source to a volume source, and a change in the type of emission source for the kiln vents from volume sources to point sources. The Department determined that all proposed changes can be accomplished in accordance with the de minimis rule.

However, in accordance with ARM 17.8.745(1)(a)(iii) because the current permit action would result in changed conditions of operation at the IMC facility that would affect the plume rise or dispersion characteristics of IMC emissions, IMC was required to submit an ambient air impact analysis (modeling) to demonstrate compliance with the applicable standards. A detailed discussion of ambient impacts associated with the changed conditions of operation at the IMC facility is contained in Section VI, Ambient Air Impact Analysis, of the Permit Analysis to this permit. Further, in accordance with ARM 17.8.745(1)(a)(i) and ARM 17.8.745(2), because the proposed permit action would change the stack on BF02 and BF03 from a vertical to horizontal or downward exhaust and thereby violate an existing condition in the IMC permit (Section II.A.17, Permit #3238-02), an Administrative Amendment in accordance with ARM 17.8.764 is required for the current permit action. Because modeling conducted for the current permit action shows compliance with all applicable standards without relying on unobstructed vertical stacks for BF02 and BF03, Section II.A.17 of Permit #3238-02, which required unobstructed vertical stacks on the affected units, was removed under the current permit action.

SECTION II: Conditions and Limitations

A. Operational Requirements

1. Malt and salable malt by-product production shall be limited to 16,000,000 bushels during any rolling 12-month time period (ARM 17.8.749).

2. IMC shall not receive more than 456,000 tons of barley during any rolling 12-month time period (ARM 17.8.749).

3. IMC shall install, operate, and maintain 3 separate fabric filter baghouses, including BF01 – Main Process Baghouse, BF02 – Grain Receiving Baghouse, and BF03 – Product Load-Out Baghouse, for the control of particulate matter (PM) and particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}) from affected operations (ARM 17.8.752).

4. IMC shall house all barley preparation processes within the headhouse and shall utilize fabric filter baghouse control for emissions from the barley preparation processes (ARM 17.8.752).

5. IMC shall unload all barley shipments to underground hoppers. IMC shall utilize fabric filter baghouse emission control on the hoppers (ARM 17.8.752).

6. IMC shall load all malt and salable malt by-product for shipment via covered conveyors. IMC shall utilize fabric filter baghouse emission control on the conveyors (ARM 17.8.752).

7. Each material transfer point for grain receiving and off-loading shall incorporate an enclosure (at least 3-sided) for fugitive emission control (ARM 17.8.752).

8. IMC shall not cause or authorize the production, handling, storage, or transportation of any material without taking reasonable precautions to control emissions of particulate matter (ARM 17.8.308).

9. IMC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

10. IMC shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.8 and II.A.9 (ARM 17.8.752).

11. Elemental sulfur burning for kiln operations shall be limited to 200 pounds of sulfur per kiln batch (ARM 17.8.749).

12. Total elemental sulfur burning for kiln operations (cumulative for all three kilns) shall be limited to 146,000 pounds during any rolling 12-month time period (ARM 17.8.749).

13. Total elemental sulfur burning for kiln operations (cumulative for all three kilns) shall not exceed 2190 hours during any rolling 12-month time period (ARM 17.8.749).

14. IMC shall burn only pipeline quality natural gas for the kiln operations process heaters (ARM 17.8.752).

15. IMC shall utilize dry low oxides of nitrogen (NO_x) combustion technology to control emissions from the HEATEC Heater #1 (25 MMBtu/hr), the HEATEC Heater #2 (42 MMBtu/hr), and the Future Plant Heater (48 MMBtu/hr) (ARM 17.8.752).

16. The design of each kiln shall include a screw auger for movement of malt product/by-product out of the kiln and the kiln heat exchanger shall be located at the top of each kiln (ARM 17.8.749).

B. Emission Limitations

1. PM_{10} emissions from the main fabric filter baghouse (BF01) shall be limited to the following (ARM 17.8.749):

   i. 0.010 gr/dscf of air-flow
   ii. 5.73 lb/hr

2. PM_{10} emissions from the grain receiving fabric filter baghouse (BF02) shall be limited to the following (ARM 17.8.749):

   i. 0.010 gr/dscf of air-flow
   ii. 0.62 lb/hr

3. PM_{10} emissions from the product load-out fabric filter baghouse (BF03) shall be limited to the following (ARM 17.8.749):

   i. 0.010 gr/dscf of air-flow
   ii. 0.30 lb/hr

4. Emissions from the MOCO process heater #1 (53.4 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	5.24 lb/hr calculated on a 1-hour averaging period
Carbon monoxide (CO)	4.40 lb/hr calculated on a 1-hour averaging period

5. Emissions from the Johnston process heater #1 (25.12 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	2.46 lb/hr calculated on a 1-hour averaging period
CO	2.07 lb/hr calculated on a 1-hour averaging period

6. Emissions from the Johnston process heater #2 (25.12 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	2.46 lb/hr calculated on a 1-hour averaging period
CO	2.07 lb/hr calculated on a 1-hour averaging period

7. Emissions from the HEATEC process heater #1 (25.0 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	1.23 lb/hr calculated on a 1-hour averaging period
CO	2.06 lb/hr calculated on a 1-hour averaging period

8. Emissions from the HEATEC process heater #2 (42.0 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	2.06 lb/hr calculated on a 1-hour averaging period
CO	3.46 lb/hr calculated on a 1-hour averaging period

9. Emissions from the Plant Heater (48.0 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NOx	2.35 lb/hr calculated on a 1-hour averaging period
CO	3.95 lb/hr calculated on a 1-hour averaging period

10. Sulfur dioxide (SO_2) emissions from each kiln shall be limited to 33.33 lb/hr during elemental sulfur burning (ARM 17.8.749).

11. IMC shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over six consecutive minutes (ARM 17.8.304).

12. IMC shall not cause or authorize any fugitive emissions to be discharged into the outdoor atmosphere that exhibit an opacity of 20% or greater averaged over six consecutive minutes (ARM 17.8.308).

C. Testing Requirements

1. IMC shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the main process baghouse (BF01) and monitor compliance with the particulate and opacity limitations in Section II.B.1 and Section II.B.11, respectively. After the initial source tests, additional source testing shall be conducted on an annual basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

2. IMC shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the grain receiving baghouse (BF02) to monitor compliance with the particulate and opacity limitations in Section II.B.2 and Section II.B.11, respectively. After the initial source tests, additional source testing shall be conducted on an every two-year basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

3. IMC shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the product load-out baghouse (BF03) to monitor compliance with the particulate and opacity limitations in Section II.B.3 and Section II.B.11, respectively. After the initial source tests, additional source testing shall be conducted on an every five-year basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

4. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the MOCO process heater #1 to monitor compliance with the emission limitations in Section II.B.4. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

5. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the Johnston process heater #1 to monitor compliance with the emission limitations in Section II.B.5. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

6. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the Johnston process heater #2 to monitor compliance with the emission limitations in Section II.B.6. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

7. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process heater #1 to monitor compliance with the emission limitations in Section II.B.7. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

8. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process heater #2 and to monitor compliance with the emission limitations in Section II.B.8. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

9. IMC shall conduct performance source testing for NO_x and CO, concurrently, on the Plant Heater to monitor compliance with the emission limitations in Section II.B.9. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

10. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of operations, IMC shall conduct performance source testing on the kiln stacks to monitor compliance with the SO_2 emission limit in Section II.B.10. The source test shall be conducted while sulfur is being burned in the batch process. After the initial source test, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

11. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

12. The Department may require further testing (ARM 17.8.105).

D. Operational Reporting Requirements

1. IMC shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. IMC shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit.

The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by IMC as a permanent business record for at least five years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. IMC shall document, by month, the total amount (in tons) of malt and salable malt by-product produced annually at the facility. By the 25th day of each month, IMC shall total the malt and salable malt by-product produced for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.1. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. IMC shall document, by month, the total amount (tons) of barley received annually by the facility. By the 25th day of each month, IMC shall total the amount (tons) of barley received during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.2. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. IMC shall document, per kiln batch, the total amount (pounds) of elemental sulfur burned. IMC shall maintain on-site records of the amount of sulfur burned per kiln batch to verify compliance with the limitation in Section II.A.11. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

7. IMC shall document, by month, the total amount (pounds) of elemental sulfur burned for kiln operations. By the 25th day of each month, IMC shall total the amount (pounds) of elemental sulfur burned during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.12. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

8. IMC shall document, by month, the total hours of elemental sulfur burning for kiln operations. By the 25th day of each month, IMC shall total the hours of elemental sulfur burning during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.13. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

E. Notification

1. Within 30 days before or after commencement of construction of Phase II of the barley malt manufacturing plant operations, IMC shall notify the Department of the date of commencement of construction (ARM 17.8.749).

2. Within 15 days before or after actual startup of Phase II operations, IMC shall notify the Department of the date of actual startup (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – IMC shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if IMC fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving IMC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by IMC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within three years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
International Malting Company, LLC – Great Falls
Permit #3238-03

I. Introduction/Process Description

A. Permitted Equipment

International Malting Company, LLC – Great Falls (IMC) operates a barley malt manufacturing plant with an initial Phase I malt and salable malt by-product production capacity of 10 million bushels per year and a final plant (after Phase II) capacity of 16 million bushels per year. The IMC plant incorporates the following equipment:

- 4 steeping vessels, each 20-meters in diameter
- 8 germinating vessels, each 31-meters in diameter
- 3 natural gas fired kilns incorporating the 6 permitted process heaters with a maximum rated heat input of 218.64 million British thermal units per hour (MMBtu/hr) heat input capacity;
- A barley washer
- Eighty silos for storing barley and malt products
- 3 process fabric filter baghouses including a main process fabric filter baghouse (BF01) with an air-flow capacity of 66,800 dry standard cubic feet per minute (dscfm), a grain (barley) receiving fabric filter baghouse (BF02) with an air-flow capacity of 7,250 dscfm, and a product load-out fabric filter baghouse (BF03) with an air-flow capacity of 3,480 dscfm
- Associated equipment

The above list of equipment includes all proposed equipment for Phase I and Phase II operations.

B. Source Description

The IMC facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE¼ of the SE¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

Malt is the processed form of barley grain and the basic ingredient in the production of beer. Malting is the process by which barley is transformed into malt. The process begins with "steeping" or soaking of clean barley kernels in large tanks of water called "steeping vessels." After steeping, the barley is then removed from the steeping vessels and placed in a germinating vessel. After a period of germination, the barley is dried and roasted in a kiln to stop the germination process and reduce the moisture content of the product, now considered malt. At this stage of the process the malt product can be easily stored and/or shipped to various locations for further processing.

Construction and operation of the proposed malting plant will occur in 2 phases. After construction of Phase I, the malting plant will have the capacity to produce from 8 to 10 million bushels of malt per year. After construction of Phase II, the malting plant capacity will increase to a maximum of 16 million bushels of malt per year. IMC will commence Phase II operations within three years of the commencement of Phase I operations. The entire malting plant encompasses approximately 10 acres of land.

C. Permit History

On May 17, 2003, IMC was issued final Montana Air Quality Permit (MAQP) **#3238-00** for the operation of a barley malt manufacturing plant with an initial Phase I malt and salable malt by-product production capacity of 10 million bushels per year and a final plant (after Phase II) capacity of 16 million bushels per year. The initially permitted IMC plant incorporated the following equipment:

- 4 steeping vessels, each 20-meters in diameter
- 8 germinating vessels, each 31-meters in diameter
- 3 natural gas fired kilns incorporating 12 primary process heaters rated at 19.1 million British thermal units per hour (MMBtu/hr) heat input capacity per process heater and 2 natural gas fired booster process heaters rated at 21 MMBtu/hr and 38 MMBtu/hr heat input capacity, respectively
- A barley washer
- Eighty silos for storing barley and malt products
- 8 process fabric filter baghouses (Baghouse #1 through Baghouse #8)
- Associated equipment

In addition, potential emissions from the initially proposed and permitted plant exceeded the applicable major source Title V permitting thresholds; therefore, on February 26, 2005, IMC was issued final and effective Title V Operating Permit **#OP3238-00**.

On April 12, 2005, the Department of Environmental Quality (Department) received a complete application for the modification of IMC's MAQP #3238-00. Specifically, the modification included the replacement of 8 fabric filter baghouses (total air-flow capacity of 215,000 dscfm) with a single fabric filter baghouse (air-flow capacity of 66,800 dscfm); replacement of the 14 previously permitted process and booster heaters (total heat input capacity 288.2 MMBtu/hr) with six proposed process heaters (total heat input capacity of 218.64 MMBtu/hr); modification of the heating system from air-to-air heat exchangers to air-to-glycol heat exchangers; change in plant layout and configuration; increase in the allowable fabric filter baghouse grain loading limit from 0.005 grains per dry standard cubic feet (gr/dscf) to 0.010 gr/dscf; and a reduction in the allowable amount of elemental sulfur (S) combusted per batch of malt from 500 pounds of S per batch (lb/batch) to 200 lb S/batch.

Prior to this permit action, potential oxides of nitrogen (NO_x), carbon monoxide (CO), and particulate matter/particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM/PM_{10}) emissions from IMC facility operations exceeded applicable Title V major source permitting thresholds. The changes resulted in a reduction in total facility potential emissions of all regulated pollutants to a level less than Title V major source permitting thresholds. Therefore, the permit action resulted in IMC being permitted as a minor source of emissions, as defined under the Title V permitting program. On June 21, 2005, the Department revoked IMC's Title V operating permit.

Finally, IMC requested that the Department remove the kilns from the emission inventory as potential PM/PM_{10} emitters. The kilns were re-designed from what was originally analyzed and permitted and, according to IMC, no particulate emissions would result from the newly designed kiln operations. Because IMC was unable to provide technical information supporting this claim and because published information contained in the Environmental Protection Agency's (EPA), AP-42, Compilation of Air Pollutant Emissions Factors, indicated that the kiln operations do in fact emit PM/PM_{10}, the Department denied this request and maintained kiln PM/PM_{10} emissions in the emission inventory under the permit action. Permit **#3238-01** replaced Permit #3238-00.

On July 6, 2005, the Department received a complete permit application from IMC for the modification of Permit #3238-01. Specifically, IMC proposed the installation and operation of 2 new fabric filter baghouse control units for grain receiving and product load-out operations, respectively. The baghouse controlling grain receiving operations has a maximum nominal flow rate of 7250 dscfm and a PM_{10} emission limit of 0.01 grains per dry standard cubic feet (gr/dscf) resulting in the Potential to Emit (PTE) 2.72 tons per year (tpy) of PM_{10}. The product load-out baghouse will have a maximum nominal flow rate of 3480 dscfm and a PM_{10} emission limit of 0.01 gr/dscf, resulting in the PTE 1.31 tpy of PM_{10}.

In addition, the main process baghouse (BF01) flow rate used in the ambient air quality impact analysis conducted for Permit #3238-01 was incorrectly reported as 59,335 actual cubic feet per minute (acfm). The correct flow rate for the affected unit is 77,404 acfm (66,800 dscfm). The modeling analysis submitted for the affected permit action addressed this correction.

Further, on August 22, 2005, the Department received comments from IMC on the Department's PD. Specifically, IMC requested the removal of the 1-hour averaging time period requirement for the applicable baghouse pound per hour (lb/hr) emission rate limits and the removal of the applicable baghouse flow-rate limitations included in the PD.

Based on the information contained in the comment letter, the Department recognized that the 1-hr averaging times for the lb/hr applicable baghouse emission limits have the effect of creating an overly stringent compliance demonstration for the affected units, in this case. Further, because the permit imposes grain loading and lb/hr emission limits on the baghouse(s) and because these limits together ensure that compliant actual emissions will not exceed emissions analyzed under the ambient air quality impact analysis conducted for the permit modification, the Department determined that the baghouse flow-rate limitations represented redundant permit requirements, in this case. Therefore, the Department modified the compliance source test requirement for the affected units to specify that the testing, including averaging times, be conducted pursuant to Method 5 and removed the subject baghouse flow-rate conditions under the DD. Permit **#3238-02** replaced Permit #3238-01.

D. Current Permit Action

On November 16, 2006, the Department received notification of proposed changes in operations at the IMC facility in accordance with the provisions contained in the Administrative Rules of Montana (ARM) 17.8.745 (de minimis rule). Specifically, IMC proposed a change in the actual location of the facility fabric filter baghouses and kiln vents, updates to the kiln building dimensions, a change in the type of emission source for baghouse BF03 from a point source to a volume source, and a change in the type of emission source for the kiln vents from volume sources to point sources. The Department determined that all proposed changes can be accomplished in accordance with the de minimis rule.

However, in accordance with ARM 17.8.745(1)(a)(iii) because the current permit action would result in changed conditions of operation at the IMC facility that would affect the plume rise or dispersion characteristics of IMC emissions, IMC was required to submit an ambient air impact analysis (modeling) to demonstrate compliance with the applicable standards. A detailed discussion of ambient impacts associated with the changed conditions of operation at the IMC facility is contained in Section VI, Ambient Air Impact Analysis, of the Permit Analysis to this permit. Further, in accordance with ARM 17.8.745(1)(a)(i) and ARM 17.8.745(2), because the proposed permit action would change the stack on BF02 and BF03 from a vertical to horizontal or downward exhaust and thereby violate an existing condition in the IMC permit (Section II.A.17, Permit #3238-02), an Administrative Amendment in accordance with ARM 17.8.764 is required for the current permit action. Because modeling conducted for the current permit

action shows compliance with all applicable standards without relying on unobstructed vertical stacks for BF02 and BF03, Section II.A.17 of Permit #3238-02, which required unobstructed vertical stacks on the affected units, was removed under the current permit action. Permit **#3238-03** replaces Permit #3238-02.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices), and shall conduct test, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   IMC shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than four hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

IMC must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over six consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, IMC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the applicability definition of any NSPS subpart in 40 CFR 60.

   40 CFR 60, Subpart DD, Standard of Performance for Grain Elevators. This subpart does not apply to the proposed facility because the facility does not meet or exceed the grain storage capacity of an affected source as defined in this subpart.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. The current permit action is considered administrative and does not require an application fee.

2. ARM 17.8.505 When Permit Required--Exclusions. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit alteration if they construct, alter or use any air contaminant sources that have the PTE greater than 25 tons per year of any pollutant. IMC has the PTE more than 25 tons per year of total PM, PM_{10}, sulfur dioxide (SO_2), NO_x, and CO; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. The current permit action is an administrative amendment and does not require an application. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. The current permit action is an administrative amendment and does not require public notice.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The current permit action does not result in any increase in emissions from the IMC facility and is an administrative amendment; therefore, a BACT analysis and determination is not required for the current permit action.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving IMC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than one year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10. In accordance with ARM 17.8.745(2) and ARM 17.8.764, the current permit action is an administrative amendment.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or a lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3238-03 for IMC, the following conclusions were made:

   a. The facility's PTE is less than 100 tons/year for all regulated pollutants.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is not subject to any current NSPS.

   e. This facility is not subject to any current NESHAP standards except 40 CFR 61, Subpart M, National Emission Standard for Asbestos.

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   Based on these facts, the Department determined that IMC is a minor source of emissions as defined under the Title V operating permit program. Prior to Permit #3238-01, IMC operations resulted in emissions of PM, NO_x, and CO which exceeded the applicable Title V major source permitting threshold(s); therefore, IMC was a Title V major source and received final and effective Title V Operating Permit #OP3238-00 on February 26, 2005. However, Permit #3238-01 modified IMC operations to the extent that potential emissions of all regulated pollutants are below the applicable Title V threshold(s) making IMC a minor source of emissions as defined under the Title V permit program. Based on this permit action, the Department revoked Title V Operating Permit #OP3238-00 on June 21, 2005.

III. BACT Determination

A BACT determination is required for each new or altered source. IMC shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was not required for the current permit action because the current permit action does not result in any increase in emissions from IMC operations and is considered an administrative permit action.

IV. Emission Inventory

tons/year						
Emission Source	**PM**	**PM_{10}**	**NO_x**	**CO**	**VOC**	**SO_x**
Main Process Baghouse (BF01) (66,800 dscfm)	50.16	25.08	0.00	0.00	0.00	0.00
Grain Receiving Baghouse (BF02) (7,250 dscfm)	5.44	2.72	0.00	0.00	0.00	0.00
Product Load-Out Baghouse (BF03) (3,480 dscfm)	2.61	1.31	0.00	0.00	0.00	0.00
MOCO Heater #1 (53.4 MMBtu/hr)	1.74	1.74	22.93	19.26	1.26	0.14
Johnston Heater #1 (25.12 MMBtu/hr)	0.82	0.82	10.79	9.06	0.59	0.06
Johnston Heater #2 (25.12 MMBtu/hr)	0.82	0.82	10.79	9.06	0.59	0.06
HEATEC Heater #1 (25 MMBtu/hr)	0.82	0.82	5.37	9.02	0.59	0.06
HEATEC Heater #2 (42 MMBtu/hr)	1.37	1.37	9.02	15.15	0.99	0.11
Future Plant Heater (48 MMBtu/hr	1.57	1.57	10.29	17.31	1.13	0.12
Elemental Sulfur Burning – Kiln Operations	0.00	0.00	0.00	0.00	0.00	36.50
Fugitive: Grain Receiving	0.80	0.18	0.00	0.00	0.00	0.00
Fugitive: Kiln Operations	25.84	23.12	0.00	0.00	0.00	0.00
Fugitive: Load-Out Operations	1.17	0.39	0.00	0.00	0.00	0.00
Fugitive: Vehicle Traffic	0.75	0.43	0.00	0.00	0.00	0.00
Total Emissions:	**93.91**	**60.36**	**69.19**	**78.86**	**5.16**	**37.06**

Main Process Baghouse (BF01) (66,800 dscfm)

Air Flow Capacity: 66,800 dscfm (Company Information)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor: 0.020 gr/dscf (EPA Baghouse Emission Factor)
Calculations: 0.020 gr/dscf * 66,800 dscf/min * 60 min/hr * 1 lb/7000 gr = 11.45 lb/hr
5.73 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 50.16 ton/yr

PM_{10} Emissions

Emission Factor: 0.010 gr/dscf (Permit Limit)
Calculations: 0.010 gr/dscf * 66,800 dscf/min * 60 min/hr * 1 lb/7000 gr = 5.73 lb/hr
5.73 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 25.08 ton/yr

Grain Receiving Baghouse (BF02) (7,250 dscfm)

Air Flow Capacity: 7250 dscfm (Company Information)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor: 0.020 gr/dscf (EPA Baghouse Emission Factor)
Calculations: 0.020 gr/dscf * 7250 dscf/min * 60 min/hr * 1 lb/7000 gr = 1.24 lb/hr
1.24 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 5.44 ton/yr

PM_{10} Emissions

Emission Factor:	0.010 gr/dscf (Permit Limit)	
Calculations:	0.010 gr/dscf * 7250 dscf/min * 60 min/hr * 1 lb/7000 gr =	0.62 lb/hr
	0.62 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	2.72 ton/yr

Product Load-Out Baghouse (BF03) (3,480 dscfm)

Air Flow Capacity:	3480 dscfm (Company Information)
Operating Hours:	8760 hr/yr

PM Emissions

Emission Factor:	0.020 gr/dscf (EPA Baghouse Emission Factor)	
Calculations:	0.020 gr/dscf * 3480 dscf/min * 60 min/hr * 1 lb/7000 gr =	0.60 lb/hr
	0.60 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	2.61 ton/yr

PM_{10} Emissions

Emission Factor:	0.010 gr/dscf (Permit Limit)	
Calculations:	0.010 gr/dscf * 3480 dscf/min * 60 min/hr * 1 lb/7000 gr =	0.30 lb/hr
	0.30 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.31 ton/yr

MOCO Heater #1 (53.4 MMBtu/hr)

Heat Input Capacity:	53.4 MMBtu/hr (Company Information)
Natural Gas Heating Value:	1020 MMBtu/MMscf (AP-42, Chapter 1.4)
Operating Hours:	8760 hr/yr (Annual Maximum)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	0.40 lb/hr
	0.40 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.74 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	0.40 lb/hr
	0.40 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.74 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	5.24 lb/hr
	5.24 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	22.93 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	4.40 lb/hr
	4.40 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	19.26 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	0.29 lb/hr
	0.29 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.26 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 53.4 MMBtu/hr =	0.03 lb/hr
	0.03 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.14 ton/yr

Johnston Heater #1 (25.12 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	2.46 lb/hr
	2.46 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	10.79 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	2.07 lb/hr
	2.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	9.06 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.14 lb/hr
	0.20 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.59 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.01 lb/hr
	0.02 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.06 ton/yr

Johnston Heater #2 (25.12 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	2.46 lb/hr
	2.46 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	10.79 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	2.07 lb/hr
	2.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	9.06 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.14 lb/hr
	0.14 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.59 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.06 ton/yr

HEATEC Heater #1 (25 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25 MMBtu/hr =	0.19 lb/hr
	0.19 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.82 ton/yr

NOx Emissions

Emission Factor:	50 lb/MMscf (AP-42, Table 1.4-2: 50% control for Dry-Low NOx Technology)	
Calculations:	50 lb/MMscf * 1 MMscf/1020 MMBtu * 25 MMBtu/hr =	1.23 lb/hr
	1.225 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	5.37 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 25 MMBtu/hr =	2.06 lb/hr
	2.06 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	9.02 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.13 lb/hr
	0.13 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.59 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 25.12 MMBtu/hr =	0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.06 ton/yr

HEATEC Heater #2 (42 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr =	0.31 lb/hr
	0.31 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.37 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr =	0.31 lb/hr
	0.31 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.37 ton/yr

NOx Emissions

Emission Factor:	50 lb/MMscf (AP-42, Table 1.4-2: 50% control for Dry-Low NOx Technology)	
Calculations:	50 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr =	2.06 lb/hr
	2.06 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	9.02 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr =	3.46 lb/hr
	3.46 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	15.15 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr = 0.23 lb/hr	
	0.23 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.99 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 42 MMBtu/hr =	0.02 lb/hr
	0.02 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.11 ton/yr

Future Plant Heater (48 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	0.36 lb/hr
	0.36 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.57 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	0.36 lb/hr
	0.36 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.57 ton/yr

NOx Emissions

Emission Factor:	50 lb/MMscf (AP-42, Table 1.4-2: 50% control for Dry-Low NOx Technology)	
Calculations:	50 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	2.35 lb/hr
	2.35 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	10.29 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	3.95 lb/hr
	3.95 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	17.31 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	0.26 lb/hr
	0.26 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.13 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 48 MMBtu/hr =	0.03 lb/hr
	0.03 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.12 ton/yr

Elemental Sulfur Burning – Kiln Operations

Molecular Weight (Sulfur):	32 lb/mol
Molecular Weight (SO_2):	64 lb/mol
Batch Process Duration:	36 hrs/batch (Company Information)
Sulfur Burning Duration - Batch Process:	3 hr/kiln batch (Company Information)
Maximum Sulfur Burned/Batch:	200 lb/kiln batch (Permit Limit)
Barley – Sulfur Absorption:	75% (Company Information – Conservative Estimate)
Kiln Throughput Capacity:	380 ton/batch/kiln (Company Information)
Number Of Kilns:	3 kilns
Operating Hours:	8760 hr/yr

Combined Total Barley Throughput Capacity (3 Kilns)
Calculations: 380 ton/batch/kiln * 1 batch/36 hr/kiln * 8760 hr/yr * 3 kilns = 277,400 ton/yr

Total Number of Batches Processed/Year (3 Kilns)
Calculations: 277,400 ton/yr * 1 batch/380 tons = 730 batches/yr (combined 3 kiln capacity)

Sulfur Burning Duration:

Calculations: 730 batches/yr * 3 hr S burning/batch = 2190 hr S burning/yr

SO_x Emissions:

Calculations: 200 lb/kiln batch * 1 kiln batch/3 hrs * 64 lb SO_2/32 lb S * (1-0.75) = 33.33 lb/hr
33.33 lb/hr * 3 hr/batch * 730 batches/yr * 0.0005 ton/lb = 36.50 ton/yr

Fugitive Emissions: Grain Receiving Pits

Barley Density: 48 lb/bu

Process Rate: 19,000,000 bu/yr (Proposed Limit)
Conversion: 48 lb/bu * 19,000,000 bu/yr * 0.0005 ton/lb = 456,000 ton/yr (Permit Limit)

PM Emissions

Emission Factor: 0.035 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Hopper Truck)
Emission Control: 90% (3-sided enclosure)
Calculations: 0.035 lb/ton * 456,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.80 ton/yr

PM_{10} Emissions

Emission Factor: 0.0078 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Hopper Truck)
Emission Control: 90% (3-sided enclosure)
Calculations: 0.0078 lb/ton * 456,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.18 ton/yr

Fugitive Emissions: Malt Kilns (3)

Malt Density: 34 lb/bu

Process Rate: 16,000,000 bu/yr (Company Information)
Conversion: 34 lb/bu * 16,000,000 bu/yr * 0.0005 ton/lb = 272,000 ton/yr

PM Emissions

Emission Factor: 0.19 lb/ton (AP-42, Table 9.9.1-2)
Calculations: 0.19 lb/ton * 272,000 ton/yr * 0.0005 ton/lb = 25.84 ton/yr

PM_{10} Emissions

Emission Factor: 0.17 lb/ton (AP-42, Table 9.9.1-2)
Calculations: 0.17 lb/ton * 272,000 ton/yr * 0.0005 ton/lb = 23.12 ton/yr

Fugitive Emissions: Malt Load-Out (2 spouts @ 190 tph & 2 spouts at 100 tph)

Process Rate: 272,000 ton/yr (Malt Production Capacity)

PM Emissions

Emission Factor: 0.086 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)
Emission Control: 90% (3-sided enclosure/load-out spout)
Calculations: 0.086 lb/ton * 272,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 1.17 ton/yr

PM_{10} Emissions

Emission Factor: 0.029 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)
Emission Control: 90% (3-sided enclosure/load-out spout)
Calculations: 0.029 lb/ton * 272,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.39 ton/yr

Fugitive Emissions: Vehicle Traffic

Assumptions:

$E = k (sL/2)^{0.65} * (W/3)^{1.5}$ (AP-42, Section 13.2.1.3, 10/02)

Where:

k = 0.028 Particle size multiplier for PM_{10} and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
k = 0.016 Particle size multiplier for PM_{10} and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
sL = 0.5 Road surface silt loading, g/m^2 (worst case default; AP-42, Section 13.2.1.3, 10/02)
W = 20 Average vehicle weight, tons (assumed)
E = 0.196 PM emission factor, lb/VMT (calculated)
E = 0.112 PM_{10} emission factor, lb/VMT (calculated)
n = 2 Number of trucks per hour (Company Information)
VMT = 0.44 Vehicle miles traveled (calculated from site plan, Permit #3238-00)

PM Emissions

Emission Factor: 0.172 lb/hr (calculated PM emission rate)
Calculations: 0.172 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.75 ton/yr

PM_{10} Emissions

Emission Factor: 0.098 lb/hr (calculated PM_{10} emission rate)
Calculations: 0.098 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.43 ton/yr

V. Existing Air Quality

The air quality of the proposed area of operation is considered attainment/unclassified for all pollutants. Until recently, a narrow area along 10th Avenue South (bounded by 9th Avenue South on the north, 11th Avenue South on the south, 54th Street South on the east and 2nd Street South on the west) was classified as a non-attainment area for CO but has since been re-designated to attainment area status under a limited maintenance plan (LMP). This re-designation became effective on July 8, 2002. Because the current permit action will not result in any change to permitted CO emissions from the IMC facility, the Department believes that the current permit action will not result in any impacts to the LMP CO attainment area. Further, since the current permit does not result in any increase in emissions from the IMC facility, the Department determined that the current permit action will not result in any increased impacts to the ambient air in the area of operations. The ambient air impact analysis contained in Section VI of this permit analysis provides a more detailed discussion of impacts resulting from the overall IMC project.

VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling, that ambient air impacts from the IMC facility will be minor. The Department determined that the current permit action will not result in IMC operations that would cause or contribute to a violation of any ambient air quality standard or PSD increment.

The maximum estimated emissions from the total proposed IMC project, including the current permit action which did not increase or decrease emissions, are approximately 69.2 tpy of NO_x, 78.6 tpy of CO, 60.36 tpy of PM_{10}, 4.79 tpy of VOCs, and 36.72 tpy of SO_2. The air quality classification for Great Falls is "Unclassifiable or Better than National Standards" (40 CFR 81.327) for all pollutants. A narrow area along 10th Avenue South (bounded by 9th Avenue South on the north, 11th Avenue South on the south, 54th Street South on the east and 2nd Street South on the west) was previously classified as a non-attainment area for CO but has since been upgraded to an attainment area under an LMP as of July 8, 2002.

Modeling Analysis

Under the current permit action, Bison Engineering, Inc. (Bison) submitted modeling on behalf of IMC to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS) and the Class II PSD increments for PM_{10}, SO_2 and NO_x. Class I increment modeling was performed for previous permit applications, and was not repeated for the current permit action.

The updated modeling used EPA's AERMOD model, version 04300 with the PRIME downwash algorithm. The model used five years of meteorological data (1987-1991) collected at the Great Falls Airport National Weather Service (NWS) Station. The NWS met data was processed for use in AERMOD using AERMET version 04300. Bison performed previous modeling for IMC using the ISC-PRIME model. Therefore, all the pollutants were re-modeled for this submittal, even though the de minimis changes only affect PM_{10} emissions sources. This memo lists all the Class II modeling results for the facility.

The receptor grid elevations were derived from digital elevation model (DEM) files using the using United States Geological Survey (USGS) 7.5-minute series (1:24,000 scale) digitized topographical maps. The AERMAP terrain preprocessor (version 04300) was used to calculate the critical dividing streamline height, H_{crit}, and the hill height at each receptor. Bison provided electronic copies of the modeling data files.

The kiln emission point is higher than previously modeled because the vents are located above the kilns on top of the "fan building". The natural gas-fired heaters have been built and modeled as horizontal discharge sources. The constructed locations of baghouses BF01 and BF03 are different than the initial modeled locations. The loadout baghouse BF03 has a downward-facing vent and was modeled as a volume source. Baghouse BF02 vents horizontally and was modeled as a point source with no initial velocity. Baghouse BF01 is modeled as a vertical open stack.

Table 1 identifies the modeled emission rates for the IMC point sources and Table 2 lists the modeling parameters for the point sources. Table 3 lists the PM_{10} emission rates and modeling parameters for the volume sources.

Table 1: Point Source Modeled Parameters

SOURCE ID	UTM Easting METERS	UTM Northing METERS	BASE ELEV. FEET	HEIGHT FEET	STACK TEMP. (DEG.K)	EXIT VEL. (FT/SEC)	STACK DIAMETER FEET
#1HEATER	480115	5265610	3460	40	200	0.033	2.0
#2HEATER	480111	5265610	3460	40	278	0.033	2.2
#3HEATER	480107	5265610	3460	40	278	0.033	2.2
#4HEATER	480103	5265610	3460	40	278	0.033	1.8
#5HEATER	480099	5265610	3460	40	278	0.033	1.8
#6HEATER	480095	5265610	3460	40	200	0.033	2.0
KLN1	480101	5265501	3461	60	100	80.2	11.3
KLN2	480100	5265541	3461	60	100	80.2	11.3
KLN3	480100	5265580	3461	60	100	80.2	11.3
BAGHOUSE BF01	480293	5265596	3460	16	70	42.1	4.7
BAGHOUSE BF02	480286	5265597	3460	25	70	0.033	2.4

Table 2: Point Source Emission Rates

SOURCE ID	NOx (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2, Ann. (lb/hr)	SO2, 3-hr (lb/hr)	SO2, 24-hr (lb/hr)
#1HEATER	5.24	0.37	4.40	0.05	0.05	0.05
#2HEATER	2.46	0.18	2.07	0.02	0.02	0.02
#3HEATER	2.46	0.18	2.07	0.02	0.02	0.02
#4HEATER	1.23	0.18	2.06	0.02	0.02	0.02
#5HEATER	2.06	0.29	3.46	0.04	0.04	0.04
#6HEATER	2.35	0.34	3.95	0.05	0.05	0.05
KLN1	0	2.03	0	2.72	33.3	4.17
KLN2	0	2.03	0	2.72	33.3	4.17
KLN3	0	2.03	0	2.72	33.3	4.17
BAGHOUSE BF01	0	5.76	0	0	0	0
BAGHOUSE BF02	0	0.62	0	0	0	0

Table 3: Volume Source Modeled Parameters and PM_{10} Emission Rates

SOURCE ID	EMISSION RATE lb/hr	UTM X (METERS)	UTM Y (METERS)	BASE ELEV. FEET	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)
Loadout Baghouse BF03	0.3	480276	5265656	3460	120	0.16	17
LOADRCV1	0.18	480314	5265598	3455	15	7.1	7
GRNRECV	0.18	480317	5265600	3455	15	7.1	7
HRD1*	0.0089	---	---	---	3.5	13.95	1.63

*The truck haul road traffic was divided into 51 identical volume sources

Compliance Demonstration

Table 4 lists the modeled impacts from all sources and pollutants at the IMC facility. Modeled impacts of all pollutants from the facility exceeded the modeling significance levels for PM_{10}, SO_2 and NO_x. Therefore, additional modeling was included to demonstrate compliance with the NAAQS/MAAQS and PSD increments.

The NAAQS/MAAQS compliance demonstration and Class II increment analyses were performed with the following sources: Montana Refining Company (MRC), Malmstrom Air Force Base (MAFB), Montana Ethanol, Southern Montana Electric Generation and Transmission Cooperative – Highwood Generating Project (SME) and Montana Megawatts (MMI). The results of the NAAQS/MAAQS analyses are summarized in Table 5. The modeling results show modeled violations of the 1-hour and annual SO_2 MAAQS. The peak SO_2 impacts occur near the MRC fence-line and are a result of modeling MRC's allowable SO_2 emissions. MRC is required to operate an ambient SO_2 monitor to verify MAAQS compliance. The peak annual SO_2 impact within IMC's 0.7 km SIA is 6.0 $\mu g/m^3$.

Table 4: IMC Class II Significant Impact Modeling

Pollutant	Avg. Period	Modeled Conc. ($\mu g/m^3$)	Class II SIL[a] ($\mu g/m^3$)	Significant (y/n)	Radius of Impact (km)
PM_{10}	24-hr	33.4	5 (1)[b]	Y	1.5
	Annual	8.8	1	Y	1.5
NO_x [c]	Annual	7.1	1	Y	2.4
CO	1-hr	410	2,000	N	------
	8-hr	164	500	N	------
SO_2	3-hr	220	25	Y	5.5
	24-hr	11.0	5 (1)[b]	Y	0.8
	Annual	2.0	1	Y	0.7
O_3	Total emission VOC: 5 tpy. Less than 100 tpy, source is exempt from O_3 analysis.				

[a] All concentrations are 1st-high for comparison to SIL's.
[b] If a proposed source is located w/in 100 km of a Class I area, an impact of 1 $\mu g/m^3$ on a 24-hour basis is significant.
[c] Ambient Ratio Method (ARM) is not used for NOx.

Table 5: NAAQS/MAAQS Compliance Demonstration

Pollu-tant	Avg. Period	Modeled Conc.[(a)] ($\mu g/m^3$)	Backgrnd Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS	MAAQS ($\mu g/m^3$)	% of MAAQS
PM_{10}	24-hr	28.9	61	90	150	60	150	60
	Annual	9.0	21	30	50	60	50	60
NO_2	1-hr	388[(b)]	75	463	------	------	564	82
	Annual	19.8[(c)]	6	26	100	26	94	28
SO_2	1-hr	1267	35	1302[(d)]	------	------	1,300	over
	3-hr	607	26	633	1,300	49	------	-----
	24-hr	181	11	192	365	53	262	73
	Annual	59.5 (6.0)[(e)]	3	63 (9.0)[(e)]	80	79 (11)[(e)]	52	over (21)[(e)]

(a) Concentrations are high-second high values except annual averages and SO_2 1-hr, which is high-6th-high.
(b) One-hour NOx impact is converted to NO_2 by applying the ozone limiting method, as per Department guidance.
(c) Annual NOx is converted to NO_2 by applying the ambient ratio method, as per Department guidance.
(d) SO_2 impacts from MRC's allowable emissions. MRC operates an ambient monitor to verify compliance.
(e) Peak impact within IMC's SIA.

The minor source baseline date for PM_{10} has been triggered in the project area. IMC submitted Class II increment compliance analyses for NO_x and SO_2 as well as PM_{10}. The PSD PM_{10} and NO_x Class II increment analyses contain emissions from IMC, MRC, MMI, MAFB, SME and Montana Ethanol sources. The SO_2 Class II increment analysis includes emissions from IMC, MMI, SME and MAFB. MRC has no SO_2 increment-consuming sources and Montana Ethanol's SO_2 emissions are insignificant. Modeling results are compared to the Class II PSD increments in Table 6.

Table 6: Class II PSD Increment Compliance Demonstration

Pollutant	Avg. Period	Modeled Conc. ($\mu g/m^3$)[(a)]	Class II Increment ($\mu g/m^3$)	% Class II Increment Consumed
PM_{10}	24-hr	28.9	30	96
	Annual	9.0	17	53
SO_2	3-hr	177	512	35
	24-hr	12.3	91	14
	Annual	2.1	20	10
NO_2	Annual[(b)]	19.2	25	77

(a) Compliance with short-term standards is based on high-2nd-high impact.
(b) Annual NO_x impacts are compared to the NO_2 standards.

As shown by this modeling demonstration, the modeled impacts from IMC are not predicted to cause or contribute to a violation of the NAAQS or any PSD increment.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

The current permit action does not increase emissions from the permitted facility and is considered an administrative amendment in accordance with the provisions contained in ARM 17.8.764; therefore, an environmental assessment is not required by the Montana Environmental Policy Act for the current permit action.

Permit Analysis Prepared By: M. Eric Merchant, MPH
Date: December 6, 2006